



1632

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Kristi D. Snell

Serial No.: 09/779,957

Art Unit: 1632

Filed: February 9, 2001

Examiner: Not Yet Assigned

For: *MULTI-GENE EXPRESSION CONSTRUCTS CONTAINING MODIFIED INTEINS*

Assistant Commissioner for Patents
Washington, D.C. 20231

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INFORMATION DISCLOSURE STATEMENT

Sir:

Pursuant to 37 C.F.R. §1.56 and 37 C.F.R. §1.97, Applicant submits an Information Disclosure Statement, including eight (8) pages of Form PTO-1449 and a copy of each document cited therein.

This Information Disclosure Statement is being filed under 37 C.F.R. § 1.97(b) prior to a first Office Action on the merits. It is believed that no fee is required with this submission. However, should a fee be required, the Commissioner is hereby authorized to charge any required fees to Deposit Account No. 50-1868.

U.S. Patents

<u>Number</u>	<u>Issue Date</u>	<u>Patentee</u>	<u>Class/Subclass</u>
5,004,863	04-02-1991	Umbeck	800/205
5,015,580	05-14-1991	Christou, et al.	435/172.3
5,015,944	05-14-1991	Bubash	324/127
5,024,944	06-18-1991	Collins, et al.	435/172.3
5,030,572	07-09-1991	Power, et al.	435/240.5
5,034,322	07-23-1991	Rogers	435/172.3

U.S.S.N.: 09/779,957
Filed: February 9, 2001

INFORMATION DISCLOSURE STATEMENT

5,159,135	10-27-1992	Umbeck	800/205
5,169,770	12-08-1992	Chee, et al.	435/172.3
5,188,958	02-23-1993	Moloney, et al.	435/240.4
5,231,019	07-27-1993	Paszkowski	435/172.3
5,268,463	12-07-1993	Jefferson	536/23.7
5,276,268	01-14-1994	Strauch, et al.	800/205
5,322,783	06-21-1994	Tomes, et al.	435/172.1
5,364,780	11-15-1994	Hershey et al.	435/172.3
5,416,011	05-16-1995	Hinchee, et al.	435/172.3
5,420,034	05-30-1995	Kridl, et al.	435/240.4
5,463,174	10-31-1995	Moloney, et al.	800/205
5,464,765	11-07-1995	Coffee, et al.	435/172.3
5,472,869	12-05-1995	Krzyzek et al.	435/240.4
5,519,164	05-21-1996	Müllner, et al.	800/205
5,527,695	06-18-1996	Hodges, et al.	435/172.3
5,530,196	06-25-1996	Fraley, et al.	800/205
5,538,877	07-23-1996	Lundquist, et al.	435/172.3
5,538,880	07-23-1996	Lundquist et al.	435/172.3
5,608,152	03-04-1997	Kridl, et al.	800/205
5,629,183	05-13-1997	Saunders et al.	435/172.3
5,650,554	07-22-1997	Moloney	800/205
5,668,298	09-16-1997	Waldron, et al.	800/205
5,750,848	05-12-1998	Kruger et al.	800/205
5,767,378	06-16-1998	Bojsen et al.	800/205
5,777,200	07-07-1998	Ryals et al.	800/205
5,834,237	11-10-1998	Jacobs et al.	435/254.21
6,011,144	01-04-2000	Steinbuchel et al.	536/23.2

Foreign Documents

<u>Number</u>	<u>Publication Date</u>	<u>Patentee</u>	<u>Country</u>
0 486 233 A2	05-20-1992	Pioneer Hi-Bred Intl, Inc.	EP
0 530 129 A1	03-03-1993	Danisco A/S	EP
0 604 662 A1	07-06-1994	Japan Tobacco, Inc.	EP
WO 91/00917 A1	01-24-1991	Mass. Inst. of Tech.	PCT
WO 93/20216	10-14-1993	University Technologies International, Inc.	PCT
WO 94/00977 A1	01-20-1994	Japan Tobacco, Inc.	PCT
WO 95/21249	08-10-1995	Scripps Research Inst	PCT
WO 98/06854 A1	02-19-1998	Monsanto Company	PCT
WO 98/36078 A1	08-20-1998	James Madison University	PCT
WO 98/00557 A3	01-08-1998	Monsanto Company	PCT
WO 99/14313 A1	03-25-1999	Metabolix, Inc.	PCT

U.S.S.N.: 09/779,957

Filed: February 9, 2001

INFORMATION DISCLOSURE STATEMENT

Publications

BANJKO & TRELEASE, "Development and application of an in vivo plant peroxisome import system," *Plant Physiol.* 107:1201-08 (1995).

BARTON, et al., "Bacillus thuringiensis δ-entotoxin expressed in transgenic *Nicotiana tabacum* provides resistance to Lepidopteran insects," *Plant Physiol.* 85:1103-09 (1987).

BEVAN, et al., "Structure and transcription of the nopaline synthase gene region of T-DNA," *Nucleic Acids Res.* 11:369-85 (1983).

BROWN, et al., "Cloning and characterization of the katB gene of *Pseudomonas aeruginosa* encoding a hydrogen peroxide-inducible catalase: purification of KatB, cellular localization, and demonstration that it is essential for optimal resistance to hydrogen peroxide," *J. Bacteriol.* 177:6536-44 (1995).

CHONG, et al., "Protein splicing involving the *Saccharomyces cerevisiae* VMA intein," *J. Biol. Chem.* 271:22159-22168 (1996).

CHONG, et al., "Protein splicing of the *Saccharomyces cerevisiae* VMA intein without the endonuclease motifs," *J. Biol. Chem.* 272:15587-15590 (1997).

CUBITT, et al., "Understanding, improving and using green fluorescent proteins," *Trends Biochem. Sci.* 20(11):448-55 (1995).

DALE & OW, "Gene transfer with subsequent removal of the selection gene from the host genome," *Proc. Natl. Acad. Sci. USA.* 88(23):10558-62 (1991).

DASGUPTA, et al., "Co-ordinated expression of multiple enzymes in different subcellular compartments in plants," *The Plant Journal* 16:107-16 (1998)).

DIRUSSO, "Primary sequence of the *Escherichia coli* fadBA operon, encoding the fatty acid-oxidizing multienzyme complex, indicates a high degree of homology to eucaryotic enzymes," *J. Bacteriol.* 172:6459-68 (1990).

DMOCHOWSKA, et al., "Structure and transcriptional control of the *Saccharomyces cerevisiae* POX1 gene encoding acyl-coenzyme A oxidase," *Gene* 88:247-52 (1990).

FALCO, et al., "Transgenic canola and soybean seeds with increased lysine," *Bio/Technology* 13:577 (1995).

FROMM, et al., "Inheritance and expression of chimeric genes in the progeny of transgenic maize plants," *Biotechnology (N Y)* 8(9):833-39 (1990).

U.S.S.N.: 09/779,957

Filed: February 9, 2001

INFORMATION DISCLOSURE STATEMENT

GASSER & FRALEY, "Genetically Engineering Plants for Crop Improvement," *Science* 244:1293-1299 (1989).

HAHN, Ph.D. Thesis, University of Minnesota (Feb. 1998).

HAPLIN, et al., "Self-processing 2A-polyproteins – a system for co-ordinate expression of multiple proteins in transgenic plants," *Plant Journal* 17(4):453-459 (1999).

HITZ, "Economic aspects of transgenic crops which produce novel products," *Current Opinion in Plant Biology* 2:135-38 (1999).

HOFFMANN. "The *pseudomonas aeruginosa* phaG gene product is involved in the synthesis of polyhydroxyalkanoic acid consisting of medium-chain-length constituents from non-related carbon sources," *FEMS Microbiology Letters* 184:253-259 (2000).

HUISMAN, et al., "Metabolism of poly(3-hydroxyalkanoates) (PHAs) by *Pseudomonas oleovorans*. Identification and sequences of genes and function of the encoded proteins in the synthesis and degradation of PHA," *J. Biol. Chem.* 266(4):2191-08 (1991).

JEFFERSON, et al., "GUS fusions: β -glucuronidase as a sensitive and versatile gene fusion marker in higher plants," *EMBO J.* 6(13):3901-07 (1987).

KATO, et al., "Production of a novel copolyester of 3-hydroxybutyric acid with a medium-chain-length 3-hydroxyalkanoic acids by *Pseudomonas* sp. 61-3 from sugars," *Appl. Microbiol. Biotechnol.* 45:363-70 (1996).

KHOUDI, et al., "An alfalfa rubisco small subunit homologue shares *cis*-acting elements with the regulatory sequences of the RbcS-3A gene from pea," *Gene* 197:343-51 (1997).

KYOZUKA, et al., "Anaerobic induction and tissue-specific expression of maize *Adh1* promoter in transgenic rice plants and their progeny," *Mol. Gen. Genet.* 228(1-2):40-48 (1991).

LEE, et al., "Biosynthesis of copolymers consisting of 3-hydroxybutyric acid and medium-chain-length 3-hydroxyalkanoic acids from 1,3-butanediol or from 3-hydroxybutyrate by *Pseudomonas* sp. A33," *Appl. Microbiol. Biotechnol.* 42: 901-909 (1995).

LIEBERGESELL & STEINBÜCHEL, "Cloning and nucleotide sequences of genes relevant for biosynthesis of poly(3-hydroxybutyric acid) in *Chromatium vinosum* strain D," *Eur. J. Biochem.* 209:135-50 (1992).

MADISON & HUISMAN, "Metabolic engineering of Poly(3-Hydroxyalkanoates): From DNA to Plastic," *Microbiology and Molecular Biology Reviews* 63:21-53 (1999).

MCELROY, et al., "Isolation of an efficient actin promoter for use in rice transformation," *Plant Cell.* 2(2):163-71 (1990).

U.S.S.N.: 09/779,957

Filed: February 9, 2001

INFORMATION DISCLOSURE STATEMENT

MEDBERRY, et al., "Intra-chromosomal rearrangements generated by Cre-lox site-specific recombination," *Nucl. Acids Res.* 23(3):485-90 (1995).

MOLONEY, et al., "High efficiency transformation of *Brassica napus* using *Agrobacterium* vectors," *Plant Cell Reports* 8:238-42 (1989).

ODELL, et al., "Identification of DNA sequences required for activity of the cauliflower mosaic virus 35S promoter," *Nature* 313(6005):810-12 (1985).

PANG, et al., "An improved green fluorescent protein gene as a vital marker in plants," *Plant Physiol.* 112:893-900 (1996).

PEOPLES & SINSKEY, "Fine structural analysis of the *Zoogloea ramigera* *phbA-phbB* locus encoding β -ketothiolase and acetoacetyl-CoA reductase: nucleotide sequence of *phbB*," *Molecular Microbiol.* 3(3):349-57 (1989).

PEOPLES & SINSKEY, "Poly- β -hydroxybutyrate in *Alcaligenes eutrophus* H16," *J. Biol. Chem.* 264:15293-97 (1989).

PEOPLES & SINSKEY, "Poly- β -hydroxybutyrate (PHB) Biosynthesis in *Alcaligenes eutrophus* H16," *J. Biol. Chem.* 264(26):15298-303 (1989).

PEOPLES, et al. "Biosynthetic Thiolase from *Zoogloea ramigera*," *J. Biol. Chem.* 262(1):97-102 (1987).

PERLER, "Inbase, the New England biolabs intein database," *Nucleic Acids Research* 27:346-347 (1999).

PERLER, et al., "Protein splicing and autoproteolysis mechanics," *Current Opinion in Chemical Biology* 1:292-299 (1997).

PERLER, et al., "Protein splicing elements: inteins and exteins—a definition of terms and recommended nomenclature," *Nucleic Acids Research* 22:1125-1127 (1994).

PLANT, et al., "Regulation of an *Arabidopsis* oleosin gene promoter in transgenic *Brassica napus*," *Plant Mol. Biol.* 25(2):193-205 (1994).

REHM, et al., "A new metabolic link between fatty acid *de Novo* synthesis and polyhydroxyalkanoic acid synthesis," *J. Biol. Chem.* 273:24044-51 (1998).

ROWLEY & HERMAN, "The upstream domain of soybean oleosin genes contains regulatory elements similar to those of legume storage proteins," *Biochim. Biophys. Acta* 1345(1):1-4 (1997).

U.S.S.N.: 09/779,957

Filed: February 9, 2001

INFORMATION DISCLOSURE STATEMENT

SATO, et al., "Primary structures of the genes, faoA and faoB, from *Pseudomonas fragi* B-0771 which encode the two subunits of the HDT multienzyme complex involved in fatty acid β -oxidation," *J. Biochem.* 111:8-15 (1992).

SHEEN, "Protein phosphatase activity is required for light-inducible gene expression in maize," *J. EMBO* 12:3497-505 (1993).

SLIGHTOM, et. al., *Proc. Natl. Acad. Sci.* 80 USA:1897-901 (1983).

SUDESH et., al., "Synthesis, structure and properties of polyhydroxyalkanoates: biological properties," *Prog. Polym. Sci.* 25: 1503-1555 (2000).

SUH, et al., "Structure of the amplified 5-enolpyruvylshikimate-3-phosphate synthase gene in glyphosate-resistant carrot cells," *Plant Mol. Biol.* 22:195-205 (1993).

TELENTI, et al., "The *Mycobacterium xenopi* GyrA protein splicing element:characterization of a minimal intein," *J. Bacteriol.* 179:6378-6382 (1997).

TIMM & STEINBÜCHEL, "Cloning and molecular analysis of the poly(3-hydroxyalkanoic acid) gene locus of *Pseudomonas aeruginosa* PAO1," *Eur. J. Biochem.* 209(1):15-30 (1992).

TRIGGS-RAINE & LOEWEN, "Physical characterization of *katG*, encoding catalase HPI of *Escherichia coli*," *Gene* 52:121-28 (1987).

XU & PERLER, "The mechanism of protein splicing and its modulation by mutation," *EMBO Journal* 15:5146-5153 (1996).

XU, et al., "Protein splicing: an analysis of the branched intermediate and its resolution by succinimide formation," *EMBO Journal* 13:5517-522 (1994).

U.S.S.N.: 09/779,957

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Remarks

This statement should not be interpreted as a representation that an exhaustive search has been conducted or that no better art exists. Moreover, Applicant invites the Examiner to make an independent evaluation of the cited art to determine its relevance to the subject matter of the present application. Applicant is of the opinion that her claims patentably distinguish over the art referred to herein, either alone or in combination.

Respectfully submitted,



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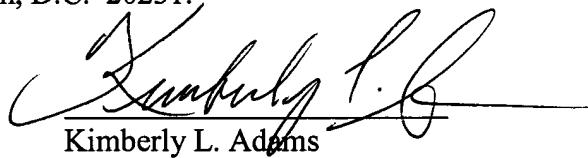
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Certificate of Mailing under 37 C.F.R. § 1.8(a)

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Date: April 25, 2002



Kimberly L. Adams

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